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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/027,977	12/20/2001	Peter Muller	4479C (CON)	1685

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EXAMINER

VANOY, TIMOTHY C

ART UNIT	PAPER NUMBER
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1754

8

DATE MAILED: 11/25/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-8

Office Action Summary

Application No.
10-027,977

Applicant(s)
MULLER et al.

Examiner
VANOY

Group Art Unit
1754

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE THREE MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☒ R sponse to THE RESPONSE MAILED ON NOV. 6, 2002 communication(s) filed on _____

☒ This action is **FINAL**.

- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-4 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-4 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some* ☐ None of the:
 - ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____
 - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____ ☐ Interview Summary, PTO-413
- ☐ Notice of Reference(s) Cited, PTO-892 ☐ Notice of Informal Patent Application, PTO-152
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948 ☐ Other _____

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DETAILED ACTION

Claim Rejections - 35 U.S.C. § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

The person having “ordinary skill in the art” has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The references of record in this application reasonably reflect this level of skill.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Pat. 5,316,738 to Kojima et al. in view of U. S. Pat. 3,211,534 to Ridgway.

The Kojima et al. patent discloses a method for preventing noble metal catalysts used for purifying automotive exhaust gases from being poisoned by phosphorus compounds in the exhaust gas by providing a phosphorus compound absorbing composition, such as calcium or magnesium chlorides, nitrates, carbonates, etc. . . supported on a cordierite honeycomb structure, for example (please see col. 1 lns. 8-18; col. 3 lines 34-46; col. 5 ln. 51 to col. 6 ln. 2 in this Kojima patent) at a location adjacent to the noble metal catalyst so that the exhaust gas initially contacts the phosphorus-sorbing Group IIA metal components (resulting in the formation of low melting point crystals, evidently containing both Group IIA metal and phosphorus: please also see col. 4 lns. 14-17 in this Kojima patent) and then the noble metal catalyst (please see fig. 2 and col. 9 ln. 65 to col. 10 ln. 3 in this Kojima patent), as embraced in the scope of Applicants' claims 1-4.

Additionally, col. 7 lns. 15-24 in this Kojima reference discloses that Group IIA element compounds are added to gasoline, evidently to also prevent poisoning of the noble metal catalyst with phosphorus components via the same Group IIA metal-phosphorus reaction referred to in col. 4 lns. 14-17 in this Kojima patent, as set forth in Applicants' claim 1. Obviously, the

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gasoline combusting the Groups IIA metal compound is going to produce an exhaust gas with the Group IIA metal compound “metered” into it at a location upstream of the catalyst.

The difference between the Applicants’ claims and the Kojima patent is that the Applicants’ have amended their claim 1 to require that the metal/metal compound is metered into the exhaust gas *separately from the engine oil or fuel*, whereas col. 7 lines 15-24 in Kojima at least fairly suggests that *the metal/metal compound may be dispersed into the gasoline* (evidently, so that the exhaust gas carries the metal/metal compound from the gasoline combustion pistons).

U. S. Pat. 3,211,534 in col. 15 lines 1-72 discloses a similar method for removing catalyst poisons out the exhaust gas from an internal combustion engine via reaction of the catalyst poison with metal/metal compounds in the exhaust gas. More specifically, col. 15 lines 69-72 fairly suggests to one skilled in the art that the dispersion of the metal/metal compounds into the fuel (as the Applicants’ argue is the case for U. S. Pat. 5,316,738) and the direct injection of the metal/metal compounds into the exhaust gas (which appears to be what the Applicants argue is the case for the pending claims) are equivalent techniques for achieving the same purpose of entraining the metal/metal compound into the exhaust gas for reaction with the catalyst poison.

It would have been obvious to one of ordinary skill in the art at the time the invention was made *to modify* the process described in U. S. Pat. 5,316,738 *by substituting* the technique of directly injecting metal/metal compounds into the exhaust gas disclosed in col. 15 lines 69-72 in U. S. Pat. 3,211,534 *in lieu of* the technique of dispersing the metal/metal compounds into the

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gasoline described in col. 7 lines 15-24 in U. S. Pat. 5,316,738 *because* the substitution of such art-recognized equivalents is obvious: please see sections 2144.06 and 2144.07 in the M.P.E.P. (Rev. 1, Feb. 2000) and the court decisions discussed therein for further details.

Response to Arguments

The Applicants' arguments submitted in their Amendment mailed on July 20, 2001 (Paper No. 20) with respect to claims 1-4 have been considered, but are not persuasive.

a) *The Applicants argue that there is no teaching or suggestion in U. S. Pat. 5,316,738 of the present invention directed to “metering a metal or metal compound for conversion of the volatile phosphorus compound into non-volatile solid compounds in the form of fine inert solid particles into the exhaust gas, separately from the engine oil and fuel, upstream of the catalyst, wherein the non-volatile solid particles are so fine that they pass unstopped through the entire exhaust system” The underlined elements are not taught or suggested by U. S. Pat. 5,316,738.*

The argued deficiencies of U. S. Pat. 5,316,738 are obvious from col. 15 lns. 15-72 in U. S. Pat. 3,211,534 where the dispersal of “finely divided catalytic particles” (please see col. 15 lns. 20-22 where it is taught that the catalyst is dispersed in a finely divided state into the exhaust gas and also ln.73) into the exhaust gas by spraying the catalyst in the exhaust gas (as taught col. 15 ln. 73) for the same purpose of preventing catalyst poisoning (please see col. 15 lns. 15-17).

All of the argued deficiencies of U. S. Pat. 5,316,738 will be met and/or remedied when the process of U. S. Pat. 5,316,738 is modified by substituting the direct metering of the anti-

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poisoning agent technique described in col. 15 lns. 69-75 in U. S. Pat. 3,211,534 in lieu of the technique of mixing the anti-poisoning agent in with the gasoline described in col. 7 lns. 15-24 in U. S. Pat. 5,316,738, and such a substitution is obvious because: (1) these two techniques are functionally equivalent for the same purpose of protecting the catalyst from poisons: please see the discussion of the *In re Fout* 675 F.2d 297, 213 USPQ 532 (CCPA 1982) court decision set forth in section 2144.06 in the MPEP (8th ed.) for further details, and (2) the metering of the anti-poison agent directly into the exhaust gas is expected to expand the number of anti-poison additives to those which are fuel insoluble (as suggested in col. 15 lns. 69-70) and also avoid the encrustation and/or deposition of unvolatilized anti-poison agent on the internal surfaces of the engine (such as the manifold, as fairly suggested in col. 15 lns. 56-63 in U. S. Pat. 3,211,534).

The limitations of forming non-volatile solids (as a consequence of injecting the anti-poisoning agent into the exhaust gas) which are so fine that they pass through the exhaust gas system are noted, but would be inherently met in the combination of U. S. Pat. 5,316,738 and U. S. Pat. 3,211,534 and the recognition of inherent properties in the prior art is prima facie obvious: please see the discussion of the court decisions set forth in section 2145(II) in the MPEP (8th ed.) for details.

b) *The Applicants argue that they are able to avoid the problems of limited solubility of the anti-poison agent in the gasoline; the additional use of dispersants for the anti-poisoning agent in the gasoline and the chemical interaction of the anti-poisoning agent with the gasoline by*

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metering the anti-poisoning agent directly into the exhaust gas (rather than mixing it is with the gasoline).

At least the disadvantage limited solubility of the anti-poisoning agent in the gasoline appears to be recognized in col. 15 lns. 23-25 in U. S. Pat. 3,211,534 where the use of fuel soluble anti-poisoning agents are discussed, and the disadvantage of having to use dispersal agents also appears to be recognized in col. 7 lns. 22-24 in U. S. Pat. 5,316,738. Therefore, the Applicants' avoidance of these problems is expected, and therefore obvious, from (at least) the cited portions of U. S. Pat. 5,316,738 and U. S. Pat. 3,211,534.

c) *The Applicants argue the differences and complications between the technique of mixing in the anti-poisoning agent with the gasoline and the technique of directly metering the anti-poisoning agent into the exhaust gas render the techniques non-equivalent (even if they achieve the same purpose).*

The Applicants' conclusion of non-equivalency is not accompanied with any evidence. The argument that there is no motivation to substitute the "direct metering" technique described in col. 15 in U. S. Pat. 3,211,534 in lieu of the "gasoline mixing" technique contemplated by U. S. Pat. 5,316,738 is not persuasive for the reasons set forth in the 103 rejection and also subparagraph (a) in this portion of the Office Action.

d) *The Applicants argue that U. S. Pat. 3,211,534 does not disclose adding the metal compound (i. e. the anti-poisoning agent) into the exhaust gas for the purpose of reacting with and removing phosphorus. U. S. Pat. 3,211,534 only adds "catalyst" to the exhaust gas to avoid*

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catalyst poisoning. This is completely different from U. S. Pat. 5,316,738 and the presently claimed invention.

The argued deficiencies of U. S. Pat. 3,211,534 do not appear to exist because there is no evidence that the process of U. S. Pat. 3,211,534 intended to exclude “phosphorus” as among those catalyst poisons alluded to in the discussion set forth in col. 15 lns. 15-75. In fact, the disclosure set forth in U. S. Pat. 5,316,738 in col. 1 lns. 42-58 fairly suggests to one skilled in the art at the time the invention was made that the claimed phosphorus can be among the catalyst poisons alluded to and treated in the process described in col. 15 lns. 15-75 in U. S. Pat. 3,211,534. No distinction is seen or has been shown between the “catalysts” mentioned in col. 15 lns. 15-75 in U. S. Pat. 3,211,534 and the “metal or metal compounds” mentioned in Applicants’ claims 1-4.

The Applicants' arguments submitted in their Response mailed on Nov. 6, 2002 (paper no. 7) have been fully considered but they are not persuasive.

a) *The Applicants argue that Ridgway (i. e. U. S. Pat. 3,211,534) discloses using metal oxides (i. e. copper and vanadium oxides) as catalysts which avoid poisoning, but not to treat the poison (lead): see col. 15 lns. 15-32 in U. S. Pat. 3,211,534.*

The catalyst dispersed either into the gasoline (please see col. 15 lns. 27-32 in U. S. Pat. 3,211,534) or directly into the exhaust gas (please see col. 15 lns. 69-72 in U. S. Pat. 3,211,534) is not among the “catalysts for purifying the exhaust gases of an internal combustion engine” set

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forth in Applicants' claim 1 lns. 1 and 2 which corresponds to the "noble metal-supporting pellets" set forth in col. 8 lns. 61-66 in U. S. Pat. 5,316,738 and also to the catalyst mentioned in col. 14 ln. 66 to col. 15 ln. 3 in U. S. Pat. 3,211,534, in the manner suggested by the Applicants' argument, but, rather, corresponds to the "metal or metal compound" set forth in Applicants' claim 1 ln. 5 and the "Group IIa element" set forth in col. 7 lns. 15-24 in U. S. Pat. 5,316,738.

The catalysts of U. S. Pat. 3,211,532 injected into either the gasoline or the exhaust gas are not "catalysts that avoid" poisoning, but are compositions that react with and render innocuous the catalyst poisons in the exhaust that may harm the *different* exhaust gas purification catalysts.

b) *The Applicants argue that U. S. Pat. 3,211,534 does not teach or suggest the treatment of the volatile phosphorus compounds of Applicants' claim 1.*

The use of a Group IIa compound to react with and render innocuous volatile phosphorus compounds that may poison the exhaust gas purification catalyst is already taught in col. 4 lns. 11-25 in U. S. Pat. 5,316,738. The "metal compound" of Applicants' claims 1-4 is not distinct from the Group IIa metal compound of U. S. Pat. 5,316,738, and the "volatile phosphorus compounds" of Applicants' claims 1-4 is not distinct from the "phosphorus contained in the exhaust gases" set forth in col. 4 lns. 14-15 in U. S. Pat. 5,316,738.

The difference between the Applicants' claims and U. S. Pat. 5,316,738 is the manner in which the Group IIa metal compound is injected into the exhaust gas: Applicants' claim 1 calls

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for metering the metal compound into the exhaust gas, whereas U. S. Pat. 5,316,738 may inject the metal compound into the gasoline (please see col. 7 lns. 15-24 in U. S. Pat. 5,316,738).

U. S. Pat. 3,211,534 is relied on to show that the metering of a catalyst poison getter either directly into the exhaust gas (as set forth in the Applicants' claims) or into the gasoline (as set forth in col. 7 lns. 15-24 in U. S. Pat. 5,316,738) are functionally equivalent (and, therefore, obvious: please see the discussion of the *In re Fout* court decision set forth in section 2144.06 in the MPEP (8th ed.)) means for achieving the same purpose of providing metal compounds in the exhaust gas to react with and remove catalyst poisons before they poison the purification catalyst: please col. 15 lns. 15-29 and lns. 68-72 in U. S. Pat. 3,211,534.

c) *The Applicants argue that Ridgway (U. S. Pat. 3,211,534) does not disclose or suggest the treatment of volatile phosphorus compounds as recited in Applicants' claim 1, nor does Ridgway disclose or suggest the Group 1A, 2A or 3A metals of Applicants' claim 4.*

The argument is not persuasive for at least the reasons set forth in sub-paragraph (b) in this portion of the Office Action. Additionally, it is noted that the copper or vanadium compounds for converting the poison set forth in col. 15 lns. 27-29 in U. S. Pat. 3,211,534 are not distinct from the "metal compound" of Applicants' claim 4 that converts the catalyst poison.

d) *The Applicants argue that it would not be obvious to combine Kojima (U. S. Pat. 5,316,738) with Ridgway (U. S. Pat. 3,211,534) because Kojima is directed to treating phosphorus and silicon poisons with Group IIa metal compounds while Ridgway uses copper (a*

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Group 1B element) and vanadium (a Group VB element) as exhaust treatment catalysts and not for poison treatment.

The argument is not persuasive for at least three reasons:

- (1) The process of U. S. Pat. 5,316,738 is not literally “combined” with the process of U. S. Pat. 3,211,534 to arrive at some agglomerated third process (in the manner that the Applicants’ argument suggest), but, rather, U. S. Pat. 3,211,534 is relied on as evidence to show that the technique of dispersing the anti-poison metal compound into the exhaust gas (as required in Applicants’ claim 1) and technique of dispersing the anti-poison agent into the gasoline (as set forth in col. 7 lns. 15-24 in U. S. Pat. 5,316,738) are functionally equivalent techniques for achieving the same purpose of removing poisons out of the exhaust gas before they poison the exhaust gas purification catalyst (please compare these two techniques described in col. 15 lns. 15-29 and lns. 68-72 in U. S. Pat. 3,211,534). Contrary to the argument set forth on pg 3 lns. 9-11 in the Response mailed on Nov. 6, 2002, no motivation is required for making such substitution of functional equivalents: please see the discussion of the *In re Fout* 675 F.2d 297, 213 USPQ 532 court decision set forth in section 2144.06 in the MPEP (8th ed.),
- (2) U. S. Pat. 5,316,738 and U. S. Pat. 3,211,534 are directed to the same art of removing catalyst poisons out of an exhaust gas, notwithstanding that the catalyst poisons differ: U. S. Pat. 5,316,738 is directed to the removal of phosphorus and silicon-containing poisons while U. S. Pat. 3,211,534 is directed to the removal of lead poison, and

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(3) the copper and vanadium oxides of U. S. Pat. 3,211,534 are not exhaust gas purification catalysts, as the Applicants' argument would have it, but are anti-poison agents.

d) *The Applicants argue that the "Response to Arguments" section in the Office Action (starting on pg. 5) does not provide any basis for obviousness for the claimed step of metering a metal or metal compound in the form of solid particles into the exhaust gas so that volatile phosphorus compounds are converted. Kojima does not add anything to the exhaust gas, and Ridgway adds additional "catalyst" to the exhaust gas.*

Ridgways' "catalysts" that metered into the exhaust gas are not exhaust gas purification catalysts (i. e. catalysts that remove contaminants such as NO_x, HC, CO, etc. out of the exhaust gas), but are the agents that react with and remove substances out of the exhaust gas that would (otherwise) poison the exhaust gas purification catalyst.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however,

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will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication should be directed to Timothy Vanoy at telephone number (703) 308-2540. The art unit Supervisor, Stanley Silverman, can be reached at phone number (703) 308-3738. The fax number for non-after final papers is (703) 872-9310, and the fax number for after final papers is (703) 872-9311. The tech center Receptionist can be reached at phone number (703) 308-0661.

Timothy Vanoy/tv

03 May 2002


19 Nov. 2002



Timothy Vanoy

Patent Examiner

Art Unit 1754



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